



HAL
open science

Les Néolithiques en Afrique : une terminologie importée et des concepts autonomes

Emmanuelle Honoré

► **To cite this version:**

Emmanuelle Honoré. Les Néolithiques en Afrique : une terminologie importée et des concepts autonomes. Collectif. Hiatus, lacunes et absences : identifier et interpréter les vides archéologiques, session Le poids de l'histoire des sciences et l'hégémonie européenne en préhistoire (H. Forestier et V. Zeitoun dir.), Société préhistorique française; Paris, 2023, 29e Congrès préhistorique de France. hal-04017019

HAL Id: hal-04017019

<https://hal.science/hal-04017019>

Submitted on 6 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Open licence - etalab

The African “Neolithics”: Imported Terminology and Local Scenarios

Les Néolithiques en Afrique : une terminologie importée et des concepts autonomes

Emmanuelle HONORÉ

Abstract: Africanist archaeologists are struggling since decades with terminologies that were imported from European research traditions. Some of these terminologies do not fit well with field evidence. Among them, the “Neolithic” remains the most problematic until today. Indeed, the many elements of the “Neolithic package” do appear in Africa as rather independent processes, with their own timings and dynamics. Beyond terminology debates, africanist archaeology is still in the process of taking its epistemological independence. In some literature, there is indeed a misconception of some major events contributing to the definition of the African “Neolithics”. In particular, pastoralism is sometimes viewed and defined as a marginal phenomenon. In this paper, I try to show how such imported views currently lead to minor the role and importance of early cattle pastoralism in the development of the African “Neolithics” especially in the northeastern part of the continent, where such phenomena first spread. The fact that such practices were not oriented towards the production of meat has contributed to their underrepresentation. If zooarchaeological evidence seems to say that it was “anything but a revolution” in terms of food subsistence, to the contrary some other evidence shows that a profound change in the relation to the world takes place with the development of early pastoralism. Cattle, with evidence for burials topped by monuments, become a mediating element central to the life of prehistoric groups. It is also the quasi-monopolistic motif of the rock art repertoire, replacing previous mythologies. Rock art displays large herds whose size might not be commensurate with food subsistence needs. It testifies to the development of new forms of social interactions. Archaeological evidence shows that all the elements defining the “African cattle complex” emerged at the very beginnings of pastoralism on the continent.

Keywords: Africa, Neolithic, terminology, domestication, pastoralism, cattle complex.

Résumé: L'archéologie de l'Afrique est tributaire de modèles élaborés pour décrire la réalité d'autres terrains. Les débats autour de la terminologie, et autour du terme « Néolithique » en particulier, n'ont cessé d'animer la discipline depuis plus d'un siècle. Au-delà de l'impression d'uniformité donnée par l'utilisation du terme « néolithisation », les recherches récentes permettent de brosser le tableau d'une série de transformations indépendantes s'étageant en Afrique sur la longue durée. Cinq à dix millénaires séparent les premières attestations de sédentarité (au moins partielle) des premières attestations de culture de céréales domestiques. Peut-on vraiment parler de « révolution » face à la dissociation des processus et face à leur étalement dans le temps ? L'origine proche-orientale des espèces animales domestiques élevées à partir de cette « révolution néolithique » tend à occulter les expériences préparatoires sur le continent. S'il fut une révolution, elle se produisit bien avant l'arrivée du premier ongulé totalement domestique sur le continent. La compréhension des scénarios africains nécessite également de se détacher des conceptions européennes, en particulier de celles attachées au pastoralisme. Alors qu'il est un développement marginal en Europe ou au Proche et Moyen-Orient, un « sous-produit du Néolithique », le pastoralisme s'est rapidement développé comme le mode de vie dominant dans une grande partie de l'Afrique. Il persiste aujourd'hui dans une forme presque inchangée dans de nombreuses régions. Les données archéologiques permettent de détecter les éléments caractéristiques du pastoralisme africain dès son émergence, au cours de la seconde moitié du VII^e millénaire avant notre ère. Principalement destinées aux productions laitières, les premières formes d'élevage sur le continent ont coexisté avec les pratiques de chasse, qu'elles n'ont pas remplacées. Aussi, si l'étude des vestiges archéozoologiques semble montrer que l'adoption du pastoral-

isme fut tout sauf une révolution, d'autres indices archéologiques contribuent à brosser le tableau d'un changement profond dans la relation au monde. La figure bovine occupe une place de premier plan : les inhumations de bovins au Sahara, parfois accompagnées de monuments, témoignent de ce statut particulier. Elle devient le thème quasi exclusif des représentations rupestres, remplaçant les répertoires variés de l'époque prépastorale. Les peintures de larges troupeaux semblent montrer que les pratiques d'élevage sont sans commune mesure avec les seuls besoins alimentaires du groupe. L'art rupestre témoigne également de nouvelles formes d'interactions sociales, dont le bétail devient un élément central. L'archéologie semble pouvoir témoigner des racines anciennes du *cattle complex* (« complexe du bétail ») africain décrit par M.J. Herskovits (1926) en référence à l'importance symbolique et sociale du bétail dans les sociétés subactuelles d'Afrique de l'Est.

Mots-clés : Afrique, Néolithique, terminologie, domestication, pastoralisme, « complexe du bétail ».

INTRODUCTION AFRICAN “NEOLITHICS”: FACTS AND FICTION

How the terminology was imported from other research traditions

In its formative phase, the archaeology in Africa has been developed by European archaeologists (Robertshaw, 1990). With their background, they imported terminologies and concepts first elaborated to describe European or Near-Eastern archaeological contexts. Efforts were soon made to elaborate africanist archaeology's own terminologies. The tri-stage classification of the Early(ier) Stone Age/Middle Stone Age/Late(r) Stone Age was put forward as early as the 1920s first for the South African contexts (Goodwin and Van Riet Lowe, 1929) and then formally and more largely adopted at the 1st (1947) and the 3rd (1955) Pan-African Congresses on Prehistory. It was also rapidly criticized. Terminology debates took such an importance that a Committee on Nomenclature was appointed at the 5th Congress (1963). Every congress was marked by vivid discussions around terminology issues, as it can be read in the proceedings of the “Systematic Investigation of the African Later Tertiary and Quaternary” conference (1965; Bishop and Clark, 1967, p. 861-875). During those discussions, “Isaac proposed that the terms ‘Earlier’, ‘Middle’ and ‘Later’ Stone Age in Africa should be abolished for all formal usage. This was agreed unanimously” (Bishop and Clark, 1967, p. 867). More than half a century after, this tri-stage terminology is still unanimously used. This proves how complex it is to find satisfactory substitutes.

The term “Neolithic” has had a long history too since it was coined by J. Lubbock (1865). Its meaning has evolved through time and space, especially in Africa. The first definition was mainly technological: the New Stone Age, as opposed to the Palaeolithic. The term was already applied to Africa as soon as the 19th century (Griffith, 1881). And until the 1960s-1970s, defining the Neolithic in the northern part of Africa was mainly based on a focus on material cultures and technological aspects: the “Neolithic of Capsian Tradition” in Algeria and Tunisia (Vaufrey, 1933), the “Neolithic of Sudanese Tradition” (Arkell, 1953) and the “Saharo-Sudanese Neo-

lithic” (Camps, 1974). The “Fayium Neolithic” was an exception since the facies was defined both by (1) the presence of bones of domesticated animals (from the 6th millennium cal. BC) and grains of domesticated plants (from 4650 cal. BC), and (2) a specific material culture (Brunton and Caton-Thompson, 1928), both components playing at an equal level.

From the 1960-1970s onwards, the focus shifted to subsistence economies. Researchers started to elaborate models on the emergence and spread of early domesticates across the continent (McBurney, 1960). At some point, the Nabta Playa controversy became central into debates (Wendorf et al., 1984; Wendorf and Schild, 1994; Gautier, 2001; Brass, 2018), as if determining a very early date for domesticated cattle in Africa was key to allow claiming that the Neolithic was as “original” in Africa as in the Near East. A causal link between food production and material culture or, more largely, cultural change has sometimes been recognized. F. Hassan describes Neolithic cultural changes as resulting “from the impact of the climatic events on the quality, amount, distribution, inter-annual variability and spatial unpredictability of water and food resources” (Hassan, 2002, p. 11). According to such views, the unpredictability of food procurement would be a primary cause for the “Neolithic” turn and cultural change would be an adaptation to such unpredictability (see section 2 of this paper). Currently, the term “Neolithic” is most often used to describe societies with a “productive economy” (Rowland et al., 2021) and having distinctive features in the material culture - such as decorated pottery (Mulazzani et al., 2016; Garcea, 2020).

The quest for substitutes

In line with the focus on economies, “food production” has been largely employed as an alternative to Neolithic (Di Lernia and Manzi, 1998). There are however important limitations to this alternative. Opposing production to predation leads to a dualistic view of prehistoric societies. The reality is less contrasted. Hunter-gatherers do produce food in a certain sense, and agro-pastors can also be predators. As some authors have mentioned, the term “production” is far from describing well the variety of engagement of prehistoric groups with the world. And it favours the view of them as primarily *Homo economicus* (Hadad, 2020, p. 195). Yet, economic rationality or effi-

ciency is not the ultimate goal of every society (Godelier, 1969).

A major trend in the 1990s has been the shift from “Neolithic” to neolithization. The process, more than the result, gained more interest. In the Near East, authors like B.D. Smith (2001) pointed out that domestication was not a short and straightforward process. In-between economies have been qualified as “low-level food production”, with four stages from the lowest to the highest degree of production: food procurement, low-level food production without domesticates, low-level food production with domesticates, and food production. G. Childe himself recognized that “the Neolithic revolution [...] was the climax of a long process. It has to be presented as a single event because archaeology can only recognize the result: the several steps leading up thereto are beyond the range of direct observation” (Childe, 1951, p. 87). Despite that, he is quite always cited for having presented the Neolithic revolution as an abrupt break. While it is vital to acknowledge the variety of configurations lying between hunting-gathering and farming, almost all schemes still follow an evolutionary view. In-between categories are viewed as “developmental stages” (Ford, 1985, fig. 1.1; Harris, 1996, fig. 15.1; Zvelebil, 1996, fig. 18; Smith, 2001, fig. 7) as if they were, above all, necessary steps towards a “full Neolithic”. In the northern part of Africa, several evidence of “in-between economies” are evidenced (see part 2), and not all of them led to domestication.

There have been other attempts to replace the term Neolithic. In Central Africa, P. de Maret put forward the “Stone to Metal Age” (Maret, 1994-1955, p. 319-320) to replace the “Congo basin Neolithic” (Clark, 1970) lacking evidence of food production and polished tools. In Central Africa, he notes, there is evidence for communities with ceramic and a certain degree of sedentarity (Maret, 1994-1995, p. 321). This “in-between” succeeds to the Later Stone Age and precedes the Iron Age but would not be perfectly described as Neolithic because of the connotations of the term. This substitute avoids the tricky matter of detecting signs of food production, which, in many African regions, produced very little evidence. Although insisting on the process of change, P. de Maret’s new term was criticized for being still reproducing the “ages and stages” evolutionary schemes (Ambrose, 1997, p. 382). Yet it has been retaken for describing the West African schemes (Casey, 2013). More generally, staging has frequently been a subject of critique (Bishop and Clark, 1967), because it implicitly establishes an equivalent to stratigraphical and/or chronological positions.

Another way to avoid all such debates is sometimes taken by using the term “Holocene archaeology” or “Holocene groups”, with no qualification of the subsistence mode, the economic orientation, nor the material culture. Local stagings were established too, having a chronological significance, but acting also as a cultural phasing. In the Acacus, extensive fieldwork programmes by the Italians led them to define a regional staging: Early

Acacus (9800-8900 BP), Late Acacus (8900-7400 BP) followed by a Pastoral period (Biagetti et al., 2004; Cancellieri and Di Lernia, 2014). Early and Late Acacus groups are hunter-gatherers, but Late Acacus groups are already in the “in-between” since they corral Barbary Sheep and store wild cereals. The Early Pastoral period is not considered by the authors as a full Neolithic. However, the rock art imagery displays representations of cattle, reflecting the spread of pastoralism - although there is of course no exact correspondence between animals depicted and the archaeological faunal spectrum (Gauguin, 2015). This shows that the cursor for defining the Neolithic is placed at very different places by different researchers. Due to the great diversity of neolithization schemes, other authors tend to consider that evidence of one of the many elements defining the Neolithic is enough to qualify groups as Neolithic or proto-Neolithic (Huysecom, 2021).

Some authors reject the term (Sinclair et al., 1993; Brass, 2013, p. 11; Wotzka, 2016). And others have pleaded for its reintroduction in certain contexts. For long, southern Africa has had no Neolithic period, until several discoveries and datings allowed to (re-)introduce the term (Orton et al., 2013; Le Meillour et al., 2020; and for the plea to re-introduce the term, see Sadr, 2003). The import of the Neolithic terminology and its concepts is thus source of never-ending debates in africanist archaeology (Shirai, 2013), sometimes regarded as “purely ideological” (Barich, 2021). Indeed, beyond the debate, what africanist archaeologists fight to belie is the idea that Africa is a continent “without history” where human groups - to the exception of the pharaonic civilization - produced no original development.

2. THE SPECIFICITIES OF THE AFRICAN NEOLITHICS

“What matters is what is in the bottle”

As L. Balout said in his time, “there are, in fact, no precise meaning for these terms and this is why they are so useful – because they are flexible” (Bishop and Clark, 1967, p. 868). “The name, said Dr Balout, is only the label on the bottle; what matters is what is in the bottle” (Bishop and Clark, 1967, p. 868). He chose to define the Neolithic as a “state of culture”. He was probably referring to material culture. Yet, the term of “culture” is itself large enough to encompass dozens of possible definitions. G. Barker also considers “Neolithic” as “a useful term to describe the socioeconomic transformations that occurred in the early to mid-Holocene” (Barker, 2013). Evolution patterns across the continent are incredibly diverse. Talking about African “Neolithics” (using the plural form) might thus be more appropriate.

As from the 1950s and the advent of radiocarbon dating, the picture of the African Neolithics has started to show its complexity. Indeed, domesticated animals

and domesticated plants appeared independently with different timings (Marshall and Hildebrand, 2002). Hunter-gatherers developed for several millennia an advanced mastery of ceramic production (Roset, 1986; Huysecom et al., 2009; Dunne, 2021). And there is evidence of hunter-gatherers being sedentary, at least to a certain degree, with several examples showing that such changes in lifeways did not necessarily lead to full agriculture (Di Lernia, 1996; Barton et al., 2021, p. 132). While acknowledging the variety of schemes in Africa, archaeologists have shown a certain inventiveness for adapting imported terminologies, qualifying cultures under the term Epipaleolithic ceramic or Pre-Neolithic ceramic (Close, 1992) – while some speak of Pre-ceramic Neolithic in other parts of the world (Guilaine et al., 2001). Since more than fifty years, researchers agree that not all societies necessarily go through uniform, unidirectional complexification patterns. Even in the Near-East, the existence of a “Neolithic” package is largely questioned. Several authors have suggested that sedentarity, the domestication of plants and the domestication of animals appeared as “separate processes and histories” (Hole, 1984, p. 49), “asynchronous process[es]” (Hadad, 2020, p. 298), not only in Africa.

In Africa, there is no place where the series of transformations that traditionally characterizes the Neolithic happened as a unique process: they were dissociated processes. In terms of chronology (fig. 1), sedentary behaviours are evidenced already from ca. 16500 BCE (Barton et al., 2021). Pottery is also one of the earliest visible changes on the continent, with evidence as early as the 10th millennium BCE (Huysecom et al., 2009). This invention provided new opportunities to broaden subsistence bases (Dunne, 2021). It certainly marks a profound change in the relationship to some resources, be they plant or animals. Evidence for domesticated animals in northeastern Africa dates back to the second half of the 7th millennium BCE. And domesticated plants are found in the North-West (Morocco) and North-East (Egypt, Merimde and then the Fayium) around 5000 BCE. These chronological landmarks mean that the whole process for all such changes took between 5 to 10 millennia, at least, in Africa.

There is not only a notable diversity of schemes, but also the coexistence of several lifeways for over long periods of time. In the Inner Niger Delta, groups of fishers, pastoralists and farmers have coexisted for millennia. In southern Africa, hunter-gatherer San groups have coexisted with neighbouring farmer groups for millennia. Our archaeological chronologies prove to be particularly irrelevant when applied to such regions. No one would dare writing that San people are still in the Later Stone Age: in our dominant social evolutionist framework, that would equate to consider them as backward. With the need for regional chronologies, some San rock art sites have been attributed to a “Neolithic” (Ego, 2015, p. 20), even though San groups never experienced a neolithisation process. Along with the “in-between economies” viewed as necessary steps towards the Neolithic, such

examples show the very limits of the social evolutionist paradigm in archaeology.

“Anything but a revolution”?

When describing the Neolithic in Island Southeast Asia, S. O’Connor describes it as “anything but a revolution” (O’Connor, 2015, p. 17). What about Africa? Was the Neolithic a revolution in Africa? “Revolutions” is the title of the last published paper collection on the neolithisation of the Mediterranean Basin (Rowland et al., 2021). In other work, one of the editors of the “Revolutions” collective opus speaks himself of the “unrevolutionary nature” of North African Neolithic (Lucarini, 2021), showing how complex the picture still is. The term “revolution” was also employed for other regions in Africa (Davies, 1960). But can we really talk about a revolution for a process extending over several millennia? Five thousand years elapsed between the first evidence of ceramic production at Ounjougou and the first domesticated plants at Merimde. During this “in-between”, prehistoric groups made use of grinding stones and exploited wild plants (Lucarini et al., 2016). This intensive selective foraging did not leave morphological changes on plants and, yet, it is already a new mode of relation, a new engagement with the world. It is sometimes described as “proto-agriculture” (Barich, 2021, p. 24), a term breaching dualistic views. Indeed, “by dint of requiring botanical evidence of production to speak of Neolithic, we end up committing a major scientific misunderstanding by defining as epipaleolithic populations whose mode of existence is unknown, simply because of the absence of direct evidence for agriculture” (Amblard and Quéchon, 1994, p. 164).

The picture is equally complex when considering animals. At least two millennia separate Nabta Playa’s reduced size aurochs and properly domesticated bovines (most likely coming from the Near East domestication process). Multiple evidence show that hunter-gatherer groups became herd keepers in the Eastern Sahara during the 7th millennium BCE (Jousse and Lesur, 2011; Dunne et al., 2018). Yet, there is no proper revolution in the zooarchaeological record. Their food supplies were apparently still mostly “wild resources”. In most Saharan regions, animal domestication has no measurable impact on hunting, as animal spectra found in remain largely bones of hunted animals after the onset of pastoralism (Kindermann and Riemer, 2021, p. 214). For most authors, as early as prehistoric groups have domesticated animals, they are Neolithic. But some leading authors consider that, until domesticates represent between 30-50% of the food procurement, groups have “in-between economies” - not full Neolithic (Smith 2001). For northeastern Africa, K. Kindermann and H. Riemer do call these groups “pastoral nomads”, before the process “ended up with early food producing communities that we like to call ‘Neolithic’” (Kindermann and Riemer, 2021, p. 204).

Hole (1984, p. 50) argues that the “Neolithic revolution” is due to the multiplier effect that happened when

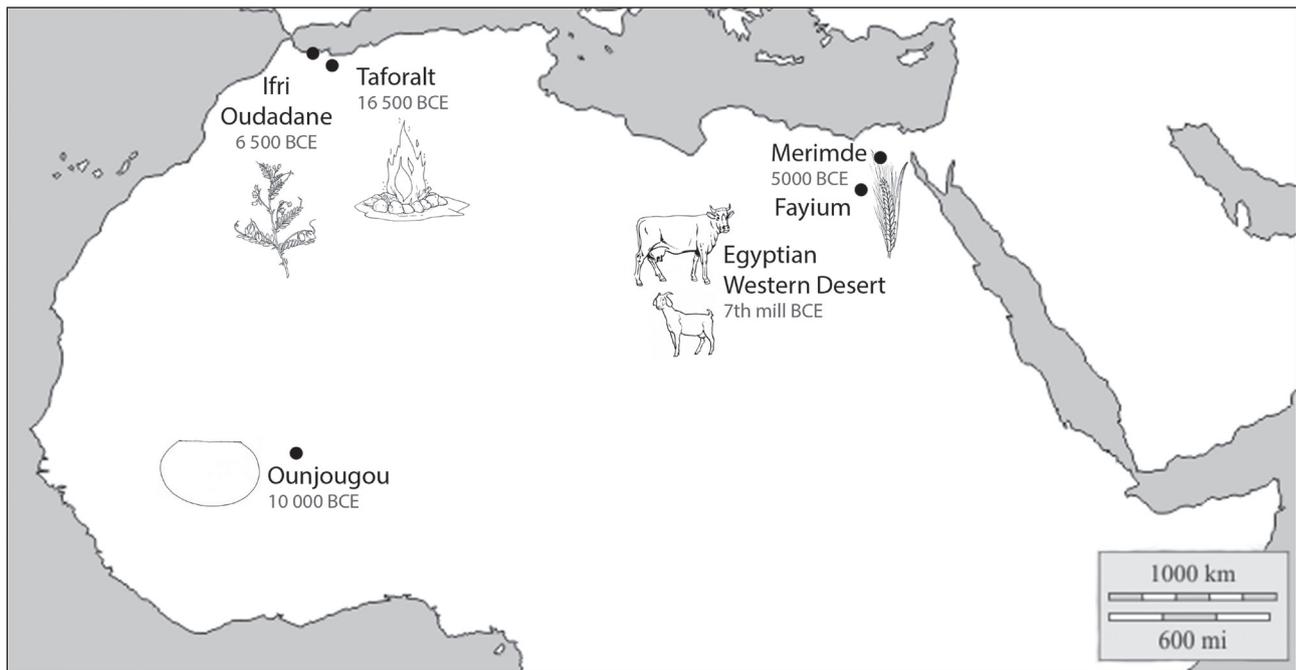


Fig. 1 – Timing and places of emergence of the earliest elements associated to neolithization in Africa.
Fig. 1 – Chronologie et lieux d'émergence des premiers éléments associés à la néolithisation en Afrique.

agriculture and stock-raising merged. In the Sahara, there are several regions where stock-raising and agriculture never merged. Between ca. 6500 and 3000 BCE, herding cattle and ovicaprines was the way of life of many groups in the Central and Eastern Sahara, whereas their sites show no trace of agriculture. Should we consider then that all these pastoralist groups have not experienced a neolithization process? This is the question examined in the part 3 of this paper. Considering all this, the term “revolution” might not be very appropriate. Some authors differentiate a First Neolithic Revolution, the one taking place in original places of domestication, from a Second Neolithic Revolution, due to the import of such new ways of life in other places (Shirai, 2013; Tassie, 2021, p. 283). Yet, a risk of perpetuating such distinction is to oppose a “core area” to “margins” or “secondary places”. Reducing Africa to a “periphery of Fertile Crescent” (Shirai, 2013, p. 2) not only perpetuates old views but also does not consider the domestication processes that were initiated on the African continent before groups adopted the animals originally domesticated in the Near East. Two examples already cited here are the corralling of Barbary sheep at Uan Afuda, Libya, and the control over aurochs at Nabta Playa, Egypt, yet there are examples for plants too.. All such interactions, ways of living with animals (or plants), taking care of them, feeding them, undoubtedly prepared local populations to adopt species domesticated in the Near East. If any revolution, it began before the first Levantine domesticates was introduced into Africa. B. Barich speaks of a “long-lasting revolution” with “multifaceted aspects” (Barich, 2021, p. 19), hereby reconciling G. Childe’s views with archaeological evidence from Africa.

FROM MISCONCEPTIONS TO EMPOWERED LATE PREHISTORIC GROUPS

Functionalist views of the African Neolithics

If different terminologies are used, there is a shared and marked trend of viewing the Neolithics (*lato sensu*) of the northern part of Africa as climate driven. Changes in plant exploitation strategies are described as “cultural adaptations” to mid-Holocene environmental and climatic change (Mercuri et al., 2011, p. 189). In the Central Sahara, prehistoric groups have provided a “cultural response” to environmental change (Cremaschi and Zerbini, 2010, p. 67). Demographic changes are relegated to a “response” to Holocene climate change (Manning and Timpson, 2014). Even more, the “motor of Africa’s evolution” would be the “climate-controlled occupation in the Sahara” (Kuper and Kröpelin, 2006, p. 803). And the development of African pastoralism is reduced to “an adaptive mechanism for dealing with the onset of arid conditions” (Manning and Timpson, 2014, p. 34). All such views follow the idea that human behaviours were primarily adaptations to climate change. The origin of such conceptions can be traced back in A. Radcliffe-Brown’s functional study of society, according to which “the process of social life is an adaptive mechanism” (Radcliffe-Brown, 1929, p. 53), himself inspired by E. Durkheim’s writings – although the latter denied being a functionalist.

The functionalist trend has been a common thread of almost all literature about the many processes that led to the development of Neolithics in the northern part of

Africa. To some extent, if it is not an imported conception of how the Neolithic burgeoned in Africa, it is yet another way of denying the innovation potential of African pre-Neolithic groups. The impression left by such literature is that they had no choice but turning to proto-Neolithic ways of life. “Caught in the grip of climate change, local societies in different habitats coped with recurrent climatic fluctuations through a variety of innovations, including intensive use of wild cereal grasses” (Hassan, 2021, p. 45). As archaeologists, we approach past societies by projecting our own conceptions and concerns, and it is true that climate change has been a critical issue since a couple of decades. In any case, the scenario is that external forces drove them to adopt new ways of life. Experiments, social mechanisms, and cultural dynamics are driving forces to investigate further.

Understanding the early African pastoralism

Several elements contributed to minor the role of the transition to pastoralism in African prehistory. In the Near East and in Europe, (semi-)nomadic pastoralism has mostly been a marginal phenomenon. C. Renfrew describes it as a “subproduct of a successful development of agriculture” (Renfrew, 1990, p. 168). Archaeological evidence from the Near or Middle East and Europe have contributed to a globalized picture of pastoralism as “usually from populations that were sedentary and then started to move”, so that this way of life has been viewed as a “new form of terrestrial wandering” (Cauvin, 1992, p. 99). Such shared views infused africanist archaeology to such a point that, nowadays, misconceptions are clearly visible in the way we interpret the archaeological record. Zooarchaeology is the key discipline for talking about early domestication. The zooarchaeological record is rather poor for domesticates during the early times of pastoralism in Africa. In the eastern Sahara, bones of domesticated animals always constitute the least fraction, not more than 30% of the total. In the Nabta Playa/Bir Kiseiba area, as noted by K. Kindermann and H. Riemer (2021, p. 204), “bones of domesticated animals are at 17% during the early 6th millennium cal. BC”. Such evidence has led authors to consider that such populations had a “primary hunting subsistence” (Kindermann and Riemer, 2021, p. 214) and that domesticated animals “only played a marginal role” (Riemer, 2007, p. 134).

The classical dichotomy between hunter-gatherers and herders has reinforced the idea that such societies relied mostly either on the one, or on the other. Although, both can be complementary regarding subsistence, and not “mutually incompatible ways of life” (Zvelebil, 1986, p. 12). Yet, raising stock does not always lead to a sedentary lifestyle, and in some cases, it is a cause for increased mobility. In semi-arid areas, favourable places for hunting were probably partly the same as favourable places for herding: both being determined by the presence of water bodies and grasses. Regarding the zooarchaeological record, V. Linseele notes that “the lack of data is in itself informative about the form that early food produc-

tion took, leaving only few archaeological traces” (Linseele, 2021, p. 64). Pastoralism leaves only faint traces for archaeology. In the Central Sahara, domestic fauna appears to be constantly underrepresented in osteological sampling of pastoralist groups (Aumassip, 2006, p. 422). For explaining the few archaeological traces, V. Linseele insists on mobile lifestyles and preservation issues. But the very specificities of African pastoralism probably played the most important part. Most African pastoralist societies slaughter cattle only for rare occasions. This means that trying to understand the place of pastoralism by interpreting the zooarchaeological record necessarily provides a biased view (Honoré, 2018, p. 208).

The importance of milking in early African pastoralism has been argued based on scenes of milking and of techniques for favouring milking depicted on rock art (Le Quellec, 2011) and on residue analyses (for analyses on early 5th millennium BCE potteries from Libya, see Dunne et al., 2012; on 5th millennium BCE potteries from Algeria, see Kherbouche et al., 2016; on 3rd millennium BCE potteries from Tanzania and Kenya, see Grillo et al., 2020). Until a recent date, Eastern African pastoralist groups like the Samburu gained from 50 to 90% of their calories from dairy food (Iannotti and Lesorogol, 2014). In view of the importance that such resources can have in food subsistence, it makes no sense to reason only on bones (testifying to meat consumption) for assessing the importance of domesticated animals in subsistence strategies. The so-called “by-products” were indeed first choice products in African early pastoralism. The coexistence of undomesticated vertebrate fauna with pottery dairy lipid residues in Mid-Holocene archaeological records illustrates well the “hunting and herding” way of life adopted by Neolithic populations across North Africa (Kherbouche et al., 2016). Other types of evidence also speak differently than zooarchaeology. The rock art record of the whole pastoral period shows a clear and remarkable obsession for cattle depictions. Cattle appear as central to social life and interactions.

The early developments of the “African cattle complex”

European conceptions of herding and of subsistence strategies have led to a sum of misinterpretations of the archaeological record. In addition, direct equivalences are made between zooarchaeological records, subsistence modes and lifestyles. It leads to the view that, in Northeastern Africa, “the earliest phase of appearance of domesticated species does not seem to have brought significant changes in lifestyles” (Linseele, 2021, p. 55). Mobility patterns might have not been profoundly modified at the onset of pastoralism but in this part, I argue that the organization of activities, the relation to cattle, and every aspect that shape “lifestyles” had certainly been deeply transformed. This new “world order” might be at the foundation of what is described as the “Cattle complex” by M. Herskovits (1926), as it is shown by the exploration of the symbolic, ideological, ritual and soci-

ological aspects of archaeological data (Di Lernia et al., 2013). The American anthropologist showed that cattle are a central element in the life of East African pastoralist groups, not only for their food subsistence, but also for power, culture, family lineage and kinship, conflicts, and the wide variety of social relations between individuals and groups. The “Cattle complex” concept refers to the symbolic and social value of cattle, which is in no way commensurate with the food requirements of such groups.

Several types of field data show that in Northeastern Africa, the emergence of cattle pastoralism is a central and major event that profoundly changed the relation of prehistoric groups to the world. Cattle burials and the association of cattle bones/bucrania to burials appear in the Sahara as early as the 6th millennium BCE (Di Lernia et al., 2013) with continuous evidence until the Late Neolithic (Ferhat et al., 1996; Paris, 1997; Paris, 2000; Applegate et al., 2001; Aumassip, 2006; Tauveron et al., 2009). The investment in cattle burials, some being topped by stone monuments, and the presence of funerary goods attest the central place of cattle in the ritual life of pastoralist groups.

Although it is notoriously difficult to precisely date rock art, it seems that the repertoire of Saharan rock art representations underwent a radical shift with the onset of pastoralism. Cattle became the quasi-monopolistic subject of most depictions (fig. 2). Relations to cattle seem to become central in the ideal world. Hybrid creatures and “transmorphic beings” disappear from the repertoire at the same moment, overcome by this “cattle invasion” (Honoré, 2021). With the onset of pastoralism, the rock art record seems to evidence an ontological revolution, a profound change in the way prehistoric groups view the world and interact within it. It is also remarkable that, while domesticated ovicaprines and bovines were adopted roughly at the same moment and are evidenced together on many sites, bovines obviously had prevalence in terms of rock art depictions and animal burials. Symbolic aspects and social importance seem to be closely connected with cattle more than with ovicaprines. Equally important as the cattle figure, herds are frequently depicted, sometimes with a very important number of livestock. Early pastoralist practises might thus have been non-commensurate to group’s food needs – one of the elements defining the “African cattle complex”.



Fig. 2 – Rock art panel displaying cattle herds of large size, Late Neolithic, Peter and Paul massif.

Fig. 2 – Panneau d’art rupestre présentant des troupes de bovins de grande taille, Néolithique récent, massif Peter et Paul.



Fig. 3 – Drawing of a Mid- to Late-Holocene rock art scene with two confronting groups,
Karkur et-Talh, Jebel el-'Uweināt (Almásy, 1936: plate VII).

Fig. 3 – Aquarelle (sans échelle) d'une scène d'art rupestre de l'Holocène moyen à récent avec deux groupes en confrontation,
Karkur et-Talh, Jebel el-'Uweināt (Almásy, 1936 : planche VII).

The depiction of humans as cattle herders in the rock art imagery reveals some aspects of their social organization. The family unit becomes the production unit, with the depiction of the “standardized couple” as herd keepers on the paintings of the WG35 shelter in the Gilf el-Kebir, Egypt (Honoré 2018). Several scenes of “battle for cattle” are found in the Mid- to Late-Holocene rock art of the eastern Saharan massifs: at the sites WG53 and WG21 in the Gilf el-Kebir, and at the sites HP21B, KD11A, KD11C and KTN28A in the Jebel el-‘Uweināt. On the scene reported by L. de Almásy, two groups of archers are facing, displayed each on a vertical curved line, with their bows under tension and many horizontal white strokes likely depicting arrows (fig. 3). The group on the left is in semi-circle around a head of cattle that they seem to try protecting. Not only might the social organization of groups have been shaped by cattle, but also the interaction between groups.

CONCLUSIVE REMARKS

The fact that terminology debates around the term “Neolithic” for Africa have found no satisfactory alternatives so far should not mitigate that they have been an excellent opportunity to collectively explore underlying concepts. Africanist archaeology is still in the process of taking its autonomy from European conceptions of the various subsistence modes and, in particular, of pastoralism. In a recent contribution, A. Dittrich has put forward the idea that the yearly organization of the Middle Nile early pastoralist groups could be compared to the seasonal cycles of Nuer groups (Dittrich, 2021, fig. 10). Such a parallel offers one of the rare integrated approaches that consider at the same time climate and environment fluctuations, subsistence activities, food supplies, mobility, housing, social events, relations between younger and

older within the group and interactions with other groups (even including raids!). The many elements contributing to the neolithisation of Africa happened over a period of at least 5 to 10 millennia, from 16500 BCE (for the earliest evidence of sedentary lifestyles) to 5000 BCE (for the earliest evidence of domesticated crops). Whether such set of transitions can be qualified as a “revolution” depends on what is under the lens. Taken together, archaeological evidence show a complex picture that totally differs from the schemes described in other parts of the world. During this transition period, the relation to the world went through profound changes, one of the most notable resulting in cattle mediating every moment of the social and symbolic life of early African pastoralist groups. Such a transition marks the beginnings of the “Cattle complex”, which is still the world order of many groups on the continent.

Acknowledgements: The writing of this article benefited from a post-doctoral fellowship IF@ULB at the Université Libre de Bruxelles (Belgium) and then a FIAS fellowship at the Paris Institute for Advanced Study (France). It has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie COFUND grant agreement no. 801505, the Marie Skłodowska-Curie grant agreement no. 945408, and from the French State programme “Investissements d’avenir”, managed by the Agence Nationale de la Recherche (ANR-11-LABX-0027-01 Labex RFIEA+).

Emmanuelle Honoré
 Université Paris 1 Panthéon-Sorbonne
 CNRS, UMR 8068, Technologie et ethnologie
 des mondes préhistoriques
 MSH Mondes
 92023 Nanterre Cedex, France
 emmanuelle.honore@univ-paris1.fr

REFERENCES

- ALMÁSY L. [DE] (1936) – *Récents explorations dans le désert Libyque*, Le Caire, Publications de la Société royale de géographie d'Égypte, 97 p.
- AMBLARD S., QUÉCHON G. (1994) – L'agriculture néolithique au Sahara méridional : faits, théories et contradictions, in G. Aumassip, N. Ferhat, A. Heddouche, R. Vernet, M. Thinon, O. Dutour, J. Onrubia-Pintado, D. Grebenart, M. Ould Khattar, K.H. Striedter, M. Tauveron, C. Dupuy, S. Amblard, G. Quéchon, J. Gaussen, R. Bedeaux, M. Bathily and F. Mori (ed.), *Milieus, hommes et techniques du Sahara préhistorique : problèmes actuels*, Paris, L'Harmattan, p. 161-170.
- AMBROSE S.H. (1997) – The Ceramic Late Stone Age, in J.O. Vogel (ed.), *Encyclopedia of Precolonial Africa*, Walnut Creek, AltaMira Press, p. 381-385.
- APPLEGATE A., GAUTIER A., DUNCAN S. (2001) – The North Tumul of the Nabta Late Neolithic Ceremonial Complex, in F. Wendorf and R. Schild (ed.), *Holocene Settlement of the Egyptian Sahara*, vol. 1 *The Archaeology of Nabta Playa*, New York, Kluwer Academic, p. 468-488.
- ARKELL A.J. (1953) – *Esh Shaheinab*, London, Oxford University Press, 114 p.
- AUMASSIP G. (2006) – Interventions humaines sur les plantes et les animaux dans le Sahara central, *Comptes rendus Palevol*, 5, p. 421-427.
- BARICH B. (2021) – Rethinking the North African Neolithic. The Multifaceted Aspects of a Long-Lasting Revolution, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 19-43.
- BARKER G. (2013) – The Neolithisation of North Africa. Reflections on Knowns, Unknowns, and Unknown Unknowns, in N. Shirai (ed.), *Neolithisation of Northeast Africa*, Leiden, Ex Oriente (Studies in Early Near Eastern Production, Subsistence, and Environment, 16), p. 249-256.
- BARTON N., BELL M., BOUZOUGGAR A., DEGROOTE I., HOGUE J., HUMPHREY L., MORALES J., TAYLOR V., TURNER E. (2021) – The Iberomaurusian Prelude to Farming in Morocco, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 121-140.
- BIAGETTI S., MERIGHI F., DI LERNIA S. (2004) – Decoding an Early Holocene Saharan Stratified Site. Ceramic Dispersion and Site Formation Processes in the Takarkori Rock-Shelter, Acacus Mountains, Libya, *Journal of African Archeology*, 2, p. 3-21.
- BISHOP W.S., CLARK J. D. (1967) – *Background to Evolution in Africa*, Chicago and London, The University of Chicago Press, 935 p.
- BRASS M. (2013) – Revisiting a Hoary Chestnut: The Nature of Early Cattle Domestication in North-East Africa, *Sahara*, 24, p. 65-70.
- BRASS M. (2018) – Early North African Cattle Domestication and Its Ecological Setting: A Reassessment, *Journal of World Prehistory*, 31, p. 81-115.
- BRUNTON G., CATON-THOMPSON G. (1928) – *The Badarian Civilisation and Predynastic Remains Near Badari*, London, British School of Archaeology in Egypt, 128 p.
- CAMPS G. (1974) – *Les civilisations préhistoriques de l'Afrique du Nord et du Sahara*, Paris, Doin, 374 p.
- CANCELLIERI E., DI LERNIA S. (2014) – Re-Entering the Central Sahara at the Onset of the Holocene: A Territorial Approach to Early Acacus Hunter-Gatherers (SW Libya), *Quaternary International*, 320, p. 43-62.
- CASEY J. (2013) – The Stone to Metal Age in West Africa, in P. Mitchell and P. J. Lane (ed.), *The Oxford Handbook of African Archaeology*, Oxford, Oxford University Press, p. 603-614.
- CAUVIN J. (1992) – À propos de l'ouvrage de C. Renfrew *L'énigme indo-européenne*. Le modèle oriental de la diffusion néolithique, *Topoi*, 2, p. 91-106.
- CHILDE V.G. (1951) – *Man Makes Himself*, New York, The New American Library, 275 p.
- CLARK J.D. (1970) – African Prehistory: Opportunities for Collaboration between Archaeologists, Ethnographers and Linguists, in D. Dalby (ed.), *Language and History in Africa*, London, Cass, p. 2-19.
- CLOSE A. (1992) – Holocene Occupation of the Eastern Sahara, in F. Klees and R. Kuper (ed.), *New Light on the Northeast African Past*, Köln, Heinrich-Barth Institut (Africa Praehistorica, 5), p. 155-183.
- CREMASCHI M., ZERBONI A. (2010) – Human Communities in a Drying Landscape: Holocene Climate Change and Cultural Response in the Central Sahara, in I. Martini and W. Chesworth (ed.), *Landscapes and Societies*, Dordrecht, Springer, p. 67-89.
- DAVIES O. (1960) – The Neolithic Revolution in Tropical Africa, *Transactions of the Historical Society of Ghana*, 4, p. 14-20.
- DI LERNIA S. (1996) – Taming Barbary Sheep: Wild Animal Management by Early Holocene Hunter-Gatherers at Uan Afuda (Libyan Sahara), *Nyame Akuma*, 46, p. 43-54.
- DI LERNIA S., MANZI G. [ed.] (1998) – *Before Food Production in North Africa, Proceedings of the Homonymous Workshop Held in Forlì, September 1996, within the XIII World Congress of the International Union of the Prehistoric and Protohistoric Sciences*, Rome, ABACO Edizioni, 177 p.
- DI LERNIA S., TAFURI M. A., GALLINARO M., ALHAIQUE F., BALASSE M., CAVORSI L., FULLAGAR P., MERCURI A.M., MONACO A., PEREGO A., ZERBONI A. (2013) – Inside the “African Cattle Complex”: Animal Burials in the Holocene Central Sahara, *PLoS ONE*, 8, e56879.
- DITTRICH A. (2021) – Revolutions of the Middle Nile. The Dynamics of a Holocene Riverscape, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing*

- Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 185-202.
- DUNNE J. (2021) – Gone to Seed? Early Pottery and Plant Processing in Holocene North Africa, *Quaternary International*, 608, p. 178-193.
- DUNNE J., EVERSHERD R., SALQUE M., CRAMP L., BRUNI S., RYAN K., BIAGETTI S., DI LERNIA S. (2012) – First Dairying in Green Saharan Africa in the Fifth Millennium BC, *Nature*, 486, p. 390-394.
- DUNNE J., DI LERNIA S., CHŁODNICKI M., KHERBOUCHE F., EVERSHERD R. (2018) – Timing and Pace of Dairying Inception and Animal Husbandry Practises Across Holocene North Africa, *Quaternary International*, 471, p. 147-159.
- EGO R. (2015) – *L’animal voyant*, Paris, Errance, 285 p.
- FERHAT N., STRIEDTER K., TAVERON M. (1996) – Un cimetière de bœufs dans le Sahara central : la nécropole de Mankhor, in G. Aumassip (ed.), *La Préhistoire de l’Afrique de l’Ouest : nouvelles données sur la période récente*, Saint-Maur, Sépia, p. 102-108.
- FORD R.I. (1985) – The Processes of Plant Food Production in Prehistoric North America, in R.I. Ford (ed.), *Prehistoric Food Production in North America*, Ann Arbor, Museum of Anthropology, University of Michigan (Anthropological Papers, 75), p. 1-18.
- GARCEA E. (2020) – *The Prehistory of the Sudan*, Cham, Springer Nature (Springer Briefs in Archaeology, Contributions from Africa, 17), 196 p.
- GAUTIER A. (2001) – The Early to Late Neolithic Archaeofaunas from Nabta and Bir Kiseiba, in F. Wendorf and R. Schild (ed.), *Holocene Settlements of the Egyptian Sahara*, vol. 1 *The Archaeology of Nabta Playa*, New York, Kluwer Academic/Plenum, p. 609-635.
- GODELIER M. (1969) – *Rationalité et irrationalité en économie*, Paris, François Maspero (Petite Collection Maspero, 81), 125 p.
- GOODWIN A.J., VAN RIET LOWE C. (1929) – *The Stone Age Cultures of South Africa*, Edinburgh, Neill (Annals of the South African Museum, 27), 289 p.
- GRIFFITH A.F. (1881) – Notes on Some Neolithic Implements from South Africa, by Mr J.C. Rickard, *Cambridge Antiquarian Communications*, 5, p. 67-74.
- GRILLO K., DUNNE J., MARSHALL F., PRENDERGAST M., CASANOVA E., GIDNA A., JANZEN A., KAREGA-MUNENE, KEUTE J., MABULLA A., ROBERTSHAW P., GILLARD T., WALTON-DOYLE C., WHELTON H., RYAN K., EVERSHERD R. (2020) – Molecular and Isotopic Evidence for Milk, Meat, and Plants in Prehistoric Eastern African Herder Food Systems, *Proceedings of the National Academy of Sciences*, 117, p. 9793-9799.
- GUAGNIN M. (2015) – Animal Engravings in the Central Sahara: A Proxy of a Proxy, *Environmental Archaeology*, 20, p. 52-65.
- GUILAINE J., BRIOIS F., CARRÈRE I., CRUBÉZY É., GIRAUD T., PHILIBERT S., VIGNE J.-D., WILLCOX G. (2001) – L’habitat néolithique pré-céramique de Shillourokambos (Parekklisha, Chypre), *Bulletin de correspondance hellénique*, 125, p. 649-654.
- HADAD R. (2020) – Inactualités de la révolution néolithique. Rousseau, l’Anthropocène et les nouveaux riches de la préhistoire, *L’Homme*, 234-235, p. 291-318.
- HARRIS D. (1996) – Domesticatory Relations of People, Plants and Animals, in R. Ellen and K. Fukui (ed.), *Redefining Nature*, Oxford, Berg, p. 437-463.
- HASSAN F.A. (2002) – Palaeoclimate, Food and Culture Change in Africa: An Overview, in F.A. Hassan (ed.), *Droughts, Food and Culture. Ecological Change and Food Security in Africa’s Later Prehistory*, Boston, Springer, p. 11-26.
- HASSAN F.A. (2021) – Last Post-Glacial Global Warming and Agricultural Origins in the Near East. A Transformability Theory, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 45-57.
- HERSKOVITS M. (1926) – The Cattle Complex in East Africa, *American Anthropologist*, 28, p. 230-272.
- HOLE F. (1984) – A Reassessment of the Neolithic Revolution, *Paléorient*, 10, p. 49-60.
- HONORÉ E. (2018) – Beheaded Cows, or Simply Headless? What Do WG35 Rock Paintings Tell Us About Mid-Holocene Pastoralists’ Minds in the Gilf el-Kebir?, in A. de Trafford, G. Tassie, O. el Daly and J. van Wetering (ed.), *A River Runs Through It: Studies in Honour of Professor Fekri A. Hassan on the Occasion of His 75th Birthday*, London, Golden House Publications, p. 202-213.
- HONORÉ E. (2021) – An Ontological Approach to Saharan Rock Art, in O. Moro Abadía and M. Porr (ed.), *Ontologies of Rock Art: Images, Relational Approaches, and Indigenous Knowledges*, London-New York, Routledge, p. 283-301.
- HUYSECOM E. (2021) – Plaidoyer pour un Néolithique ancien en Afrique subsaharienne, *Ounjougou : peuplement humain et paléoenvironnement en Afrique*, [on line] <https://www.ounjougou.org/fr/projets/mali/archeologie/plaidoyer-pour-un-neolithique-ancien-en-afrique-subsaharienne/>
- HUYSECOM E., RASSE M., LESPEZ L., NEUMANN K., FAHMY A., BALLOUCHE A., OZAINNE S., MAGGETTI C., TRIBOLO C., SORIANO S. (2009) – The Emergence of Pottery in Africa During the 10th Millennium calBC: New Evidence from Ounjougou (Mali), *Antiquity*, 83, p. 905-917.
- IANNOTTI L., LESOROGOL C. (2014) – Animal Milk Sustains Micro-nutrient Nutrition and Child Anthropometry among Pastoralists in Samburu, Kenya, *American Journal of Physical Anthropology*, 155, p. 66-76.
- JOUSSE H., LESUR J. (2011) – *People and Animals in Holocene Africa: Recent Advances in Archaeozoology*, Frankfurt, Africa Magna Verlag (Reports in Africa Archaeology, 2), 142 p.
- KHERBOUCHE F., DUNNE J., MERZOUG S., HACHI S., EVERSHERD R. (2016) – Middle Holocene Hunting and Herding at Guel-daman Cave, Algeria: An Integrated Study of the Vertebrate Fauna and Pottery Lipid Residues, *Quaternary International*, 410, p. 50-60.
- KINDERMANN K., RIEMER H. (2021) – From Complex Hunter-Gatherers in the Eastern Sahara to the Early Nile Neolithic, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions*.

- The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 185-202.
- KUPER R., KRÖPELIN S. (2006) – Climate-Controlled Holocene Occupation in the Sahara: Motor of Africa's Evolution, *Science*, 313, p. 803-807.
- LE MEILLOUR L., ZIRAH S., ZAZZO A., CERSOY S., DÉTROIT F., IMALWA E., LEBON M., NANKELA A., TOMBRET O., PLEUR-DEAU D., LESUR J. (2020) – Palaeoproteomics Gives New Insight into Early Southern African Pastoralism, *Scientific Reports*, 10, p. 1-11.
- LE QUELLEC J.-L. (2011) – Provoking Lactation by the Insufflation Technique as Documented by the Rock Images of the Sahara, *Anthropozoologica*, 46, p. 65-125.
- LINSELE V. (2021) – Early Livestock in Egypt: Archaeozoological Evidence, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 59-68.
- LUBBOCK J. (1865) – *Pre-Historic Times as Illustrated by Ancient Remains and the Manners and Customs of Modern Savages*, London, William & Norgate, 512 p.
- LUCARINI G. (2021) – Les escargots, la bouillie et l'agneau, s'il vous plaît, *Exploring the unrevolutionary nature of North African Neolithic*, EEHAR Online talk (8th September 2021), [on line] <https://www.eehar.csic.es/on-line-talks-exploring-the-unrevolutionary-nature-of-north-african-neolithic/>
- LUCARINI G., RADINI A., BARTON H., BARKER G. (2016) – The Exploitation of Wild Plants in Neolithic North Africa. Use-Wear and Residue Analysis on Non-Knapped Stone Tools from the Haua Fteah Cave, Cyrenaica, Libya, *Quaternary International*, 410, p. 77-92.
- MANNING K., TIMPSON A. (2014) – The Demographic Response to Holocene Climate Change in the Sahara, *Quaternary Science Reviews*, 101, p. 28-35.
- MARET P. [DE] (1994-1995) – Pits, Pots and the Far West Stream, *Azania*, 29-30, p. 318-323.
- MARSHALL F., HILDEBRAND E. (2002) – Cattle before Crops: The Beginnings of Food Production in Africa, *Journal of World Prehistory*, 16, p. 99-143.
- MCBBURNEY C. (1960) – *The Stone Age of Northern Africa*, Harmondsworth, Penguin Books, 288 p.
- MERCURI A., SADORI L., OLLERO P.U. (2011) – Mediterranean and North-African Cultural Adaptations to Mid-Holocene Environmental and Climatic Changes, *Holocene*, 21, p. 189-206.
- MULAZZANI S., BELHOUCHE L., SALANOVA L., AOUADI N., DRIDI Y., EDDARGACH W., MORALES J., TOMBRET O., ZAZZO A., ZOUGHLAMI J. (2016) – The Emergence of the Neolithic in North Africa: A New Model for the Eastern Maghreb, *Quaternary International*, 410, p. 123-143.
- O'CONNOR S. (2015) – Rethinking the Neolithic in Island Southeast Asia, with Particular Reference to the Archaeology of Timor-Leste and Sulawesi, *Archipel*, 90, p. 15-47.
- ORTON J., MITCHELL P., KLEIN R., STEELE T., HORSBURGH K. (2013) – An Early Date for Cattle from Namaqualand, South Africa: Implications for the Origins of Herding in Southern Africa, *Antiquity*, 87, p. 108-120.
- PARIS F. (1997) – Les inhumations de *Bos* au Sahara méridional au Néolithique, *Archaeozoologia*, 9, p. 113-122.
- PARIS F. (2000) – African Livestock Remains from Saharan Mortuary Contexts, in R. Blench and K. MacDonalds (ed.), *The Origins and Development of African Livestock: Archaeology, Genetics, Linguistics and Ethnography*, London, University College Press, p. 111-126.
- RADCLIFFE-BROWN A. (1929) – A Further Note on Ambrym, *Man*, 29, p. 50-53.
- RENFREW C. (1990) – *L'énigme indo-européenne, archéologie et langage*, Paris, Flammarion (collection « Histoires »), 400 p.
- RIEMER H. (2007) – When Hunters Started Herding: Pasto-Foragers and the Complexity of Holocene Economic Change in the Western Desert of Egypt, in M. Bollig, O. Bubbenzer, R. Vogelsang and H.-P. Wotzka (ed.), *Aridity, Change and Conflict in Africa*, Proceedings of an International ACACIA Conference (Königswinter, Germany 2003), Köln, Heinrich-Barth Institut, p. 105-144.
- ROBERTSHAW P. (1990) – *A History of African Archaeology*, London, James Curry, 378 p.
- ROSET J.-P. (1986) – La céramique des gisements de Tagalagal et de l'Adrar Bous X (Aïr, République du Niger) : résultats des analyses, *Cahier des sciences humaines de l'ORSTOM*, 22, p. 151-158.
- ROWLAND J.M., LUCARINI G., TASSIE G.J. (2021) – *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi, 293 p.
- SADR K. (2003) – The Neolithic of Southern Africa, *The Journal of African History*, 44, p. 195-209.
- SHIRAI N. (2013) – *Neolithisation of Northeastern Africa, Berlin, Ex Oriente (Studies in Early Near Eastern Production, Subsistence, and Environment, 16)*, 256 p.
- SINCLAIR P., SHAW T., ANDAH B. (1993) – Introduction, in T. Shaw, P. Sinclair, B. Andah and O. Alex (ed.), *The Archaeology of Africa. Food, Metals and Towns*, London-New York, Routledge, p. 1-31.
- SMITH B.D. (2001) – Low Level Food Production, *Journal of Archaeological Research*, 9, p. 1-43.
- TASSIE G. (2021) – A Multiple-Scale Approach to the Neolithisation of Lower Egypt, in J.M. Rowland, G. Lucarini and G.J. Tassie (ed.), *Revolutions. The Neolithisation of the Mediterranean Basin: The Transition to Food Producing Economies in North Africa, Southern Europe and the Levant*, Berlin, Topoi (Studies of the Ancient World, 68), p. 265-293.
- TAUVERON M., STRIEDTER K., FERHAT N. (2009) – Neolithic Domestication and Pastoralism in Central Sahara: The Cattle Necropolis of Mankhor (Tadrart Algérienne), in R. Baumhauer and J. Runge (ed.), *Holocene Palaeoenvironmental History of the Central Sahara*, London, Taylor & Francis (Palaeoecology of Africa, 29), p. 179-186.
- VAUFREY R. (1933) – Notes sur le Capsien, *L'Anthropologie*, 43, p. 453-483.

- WENDORF F., SCHILD R. (1994) – Are the Early Holocene Cattle in the Eastern Sahara Domestic or Wild?, *Evolutionary Anthropology*, 3, p. 118-128.
- WENDORF F., SCHILD R., CLOSE A. (1984) – *Cattle Keepers of the Eastern Sahara: The Neolithic of Bir Kiseiba*, Dallas, Southern Methodist University, 452 p.
- WOTZKA H.P. (2016) – Neolithikum und Afrika: Kleiner Survey nach Objekten für den Kulturvergleich, in T. Kerig, K. Nowak and G. Roth (ed.), *Alles was zählt... Festschrift für Andreas Zimmermann*, Bonn, Habelt (Universitätsforschungen zur prähistorischen Archäologie, 285), p. 409-429.
- ZVELEBIL M. (1986) – Mesolithic Prelude and Neolithic Revolution, in M. Zvelebil (ed.), *Hunters in Transition*, Cambridge, Cambridge University Press, p. 5-15.
- ZVELEBIL M. (1996) – Agricultural Frontier and the Transition to Farming in the Circum-Baltic Area, in D. Harris (ed.), *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, London, UCL Press, p. 323-345.